Amendments to the Claims

The following listing of claims replaces all prior listings and versions of claims in this application.

1. (Original) A cell population comprising insulin-producing cells derived from human embryonic stem cells.

2. (Original) The cell population of claim 1 enriched for insulin-producing cells derived from human embryonic stem cells.

3. (Original) The cell population of claim 2 wherein the enrichment comprises treatment of the human embryonic stem cells with insulin, transferrin and selenite.

4. (Original) The cell population of claim 1 comprising selected insulin-producing cells derived from human embryonic stem cells.

5. (Original) The cell population of claim 1 comprising isolated insulin-producing cells derived from human embryonic stem cells.

6. (Original) The cell population of claim 1 comprising cloned insulin-producing cells derived from human embryonic stem cells.

7. (Original) A cell population comprising regulatable insulin-producing cells derived from human embryonic stem cells.

8. (Original) The cell population of claim 7 comprising glucose-responsive insulin-producing cells derived from human embryonic stem cells.

9. (Original) The cell population of claim 8 enriched for glucose-responsive insulin-producing cells derived from human embryonic stem cells.

10. (Original) The cell population of claim 9 wherein the enrichment comprises treatment with insulin, transferrin and selenite.

11. (Original) The cell population of claim 8 comprising selected glucose-responsive insulin-producing cells derived from human embryonic stem cells.

12. (Original) The cell population of claim 8 comprising isolated glucose responsive insulin-producing cells derived from human embryonic stem cells.

13. (Original) The cell population of claim 8 comprising cloned glucose-responsive insulin-producing cells derived from human embryonic stem cells.

14. (Original) The glucose responsive insulin-producing cells of claim 8 wherein said cells express at least one gene from the group of: insulin, islet glucokinase, Glut-2 glucose transporter, Glut-1 glucose transporter, insulin promoter factor1/pancreatic and duodenal homeobox gene 1 IFP1/PDX1 transcription factor, and Ngn3 transcription factor.

15. (Original) A cell population comprising stable insulin-producing cells derived from human embryonic stem cells.

16. (Original) The cell population of claim 15 comprising stable clonal insulin-producing cells derived from human embryonic stem cells.

17. (Original) The cell population of claim 15 comprising insulin-producing cells derived from human embryonic stem cells overexpressing hTERT.

18. (Original) The cell population of claim 15 comprising insulin-producing cells derived from human embryonic stem cells stably transfected with a construct comprising an insulin promoter.

19. (Original) The cell population of claim 18 comprising cloned insulin-producing cells derived from human embryonic stem cells stably transfected with an insulin promoter.

20. (Canceled)

21. (Canceled)

22. (Canceled)

23. (Canceled)

24. (Canceled)

25. (Canceled)

26. (Withdrawn and Currently Amended) A method for in vitro enrichment of the insulin-producing cells of claim 1 ~~derived from stem cells~~, comprising the steps of: (i) culturing undifferentiated pluripotent stem cells in a chemically defined serum-free culture medium complemented with supplements selected from: serum replacement; nonessential amino acids; mercaptoethanol; glutamine; or fibroblast growth factor, and (ii) disaggregating and transferring the adherent cell cultures from (i) to suspension culture in bacterial-grade petri dish; and (iii) adding to the culture medium of the cells from (ii) supplements selected from the group consisting of: insulin; transferrin and sodium selenite (ITS); glucose; nicotinamide; keratinocyte growth factor; fibroblast growth factor; vascular endothelial growth factor; epidermal growth factor; nerve growth factor; activin; and β-cellulin.

27. (Withdrawn and Currently Amended) The method in claim 26 comprising the following [[step]] steps: (i) culturing undifferentiated pluripotent stem cells on a feeder layer in a chemically defined serum-free culture medium complemented with supplements selected from: serum replacement; nonessential amino acids; mercaptoethanol; glutamine; or filroblast growth factor; and (ii) disaggregating and transferring the adherent cell cultures from (i) to suspension culture in bacterial-grade petri dish; and (iii) culturing the cells in (ii) for 4-5 in a culture medium as in (i) in the absence of fibroblast growth factor; and (iv) disaggregating and transferring the embryoid bodies formed in (iii) to fibronectin coated tissue culture dishes in serum-free medium; (v) adding to the culture medium of (iv) supplements selected from the group consisting of: fibronectin; transferrin and sodium selenite (ITS); and (vi) adding to

the culture medium of (v) supplements selected from the group consisting of: B27 supplement (GIBCO); N2 supplement (GIBCO); laminin: and fibroblast growth factor; and (vii) replacing the culture medium in (vi) with culture medium comprising supplements selected from the group consisting of: B27 supplement (GIBCO); N2 supplement (GIBCO); laminin; and nicotinamide.

28. (Withdrawn and Currently Amended) In a method of cell replacement therapy, the improvement which comprises administering to a subject in need of such therapy the insulin producing cells of claim 1 ~~derived from human embryonic stem cells~~.

29. (Withdrawn) The method of claim 28 wherein the cells are transplanted into the subject's pancreas.

30. (Withdrawn) The method of claim 28 wherein the cells are transplanted into an ectopic site in the subject.

31. (Withdrawn and Currently Amended) A method of treating a patient in need thereof with insulin producing cells derived from human embryonic stem cells comprising transplantation of [[a]] the cell population of claim 1 ~~comprising insulin producing cells derived from human embryonic stem cells~~.

32. (Withdrawn and Currently Amended) The method of claim 31 comprising transplantation of [[a]] the cell population of claim 1 ~~comprising insulin producing cells derived from human embryonic stem cells~~ into the pancreas.

33. (Withdrawn and Currently Amended) The method of claim 31 comprising transplantation of [[a]] the cell population of claim 1 ~~comprising insulin producing cells derived from human embryonic stem cells~~ to an ectopic site.

34. (New) The glucose responsive insulin-producing cells of claim 8 wherein said cells express the insulin gene.